BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Lamberton et al.	:	Before the Examiner: Nguyen, Dustin
Serial No.: 09/523,056	:	Group Art Unit: 2154
Filed: March 10, 2000	:	
Title: SYSTEM AND METHOD FOR IMPROVED LOAD BALANCING AND HIGH AVAILABILITY IN A DATA PROCESSING SYSTEM HAVING AN IP HOST WITH A MARP LAYER	:	IBM Corporation P.O. Box 12195 Dept. 9CCA, Bldg. 002-2 Research Triangle Park, NC 27709

AMENDED APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. REAL PARTY IN INTEREST

The real party in interest is International Business Machines Corporation, which is the assignee of the entire right, title and interest in the above-identified patent application.

CERTIFICATION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on October 7, 2004.

Serena Beller
Signature

Serena Beller
(Printed name of person certifying)

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, Appellants' legal representative or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-16 are pending in the Application. Claims 1-16 stand rejected. Claims 1-16 are appealed.

IV. STATUS OF AMENDMENTS

The Appellants' response to the Office Action having a mailing date of September 29, 2003, has been considered, but the Examiner indicated that it did not place the application in condition for allowance because Appellants' arguments were deemed unpersuasive.

V. SUMMARY OF CLAIMED SUBJECT MATTER

When communication of data has to be established from a source host to a particular computer IP destination over an IP network, there are a number of methods to determine the first hop router of the network leading towards this destination. Specification, page 2, lines 19-21. These include running (or snooping) dynamic routing protocols such as Routing Information Protocol (RIP) or Open Shortest Path First (OSPF) version, running an Internet Control Message Protocol (ICMP) router discovery client or using a statically configured default route. Specification, page 2, line 22 – page 3, line 2.

Running a dynamic routing protocol on every end host may be infeasible for a number of reasons, including administrative overhead, processing overhead, security issues or lack of a protocol implementation for some platforms. Specification, page

3, lines 3-5. Neighbor or router discovery protocols may require active participation by all hosts on a network, leading to large timer values to reduce protocol overhead in face of a large number of hosts. Specification, page 3, lines 5-8. This can result in significant delay in the detection of a lost neighbor, which may introduce unacceptably long "black hole" periods. Specification, page 3, lines 8-9.

The use of a statically configured default route is quite popular. Specification, page 3, line 10. It minimizes configuration and processing overhead on the end host and is supported by virtually every IP implementation. Specification, page 3, lines 10-12. This mode of operation is likely to persist as Dynamic Host Configuration Protocols (DHCP) are deployed, which typically provide configuration for an end host IP address and default gateway. Specification, page 3, lines 12-14. However, this creates a single point of failure. Specification, page 3, lines 14-15. Loss of the default router results in a catastrophic event, isolating all end hosts that are unable to detect any alternate path that may be available. Specification, page 3, lines 15-16.

One solution to solve this problem is to allow hosts to appear to use a single router and to maintain connectivity even if the actual first hop router they are using fails. Specification, page 3, lines 17-19. Multiple routers participate in this protocol and in concert create the illusion of a single virtual router. Specification, page 3, lines 19-20. The protocol insures that one and only one of the routers is forwarding packets on behalf of the virtual router. Specification, page 3, lines 20-21. End hosts forward their packets to the virtual router. Specification, page 3, lines 21-22. The router forwarding packets is known as the active router. Specification, page 3, line 22. A standby router is selected to replace the active router should it fail. Specification, page 3, lines 22-23. The protocol provides a mechanism for determining active and standby routers using the IP addresses on the participating routers. Specification, page 3, line 23 – page 4, line 2. If an active router fails, a standby router can take over without a major interruption in the host's connectivity. Specification, page 4, lines 2-3.

Another similar approach is the use of Virtual Router Redundancy Protocol (VRRP) designed to eliminate the single point of failure inherent in the static default routed environment. Specification, page 4, lines 4-6. VRRP specifies an election protocol that dynamically assigns responsibility for a virtual router to one of the VRRP routers on a LAN. Specification, page 4, lines 6-7. The VRRP router controlling the IP address(es) associated with a virtual router is called the Master and forwards packets sent to these IP addresses. Specification, page 4, lines 7-9. The election process provides dynamic fail-over in the forwarding responsibility should the Master become unavailable. Specification, page 4, lines 9-11. Any of the virtual router's IP addresses on a LAN can then be used as the default first hop router by the end hosts. Specification, page 4, lines 11-12. The advantage gained by using VRRP is a higher availability default path without requiring configuration of dynamic routing or router discovery protocols on every end host. Specification, page 4, lines 12-14.

Unfortunately, the two solutions above cannot provide load balancing for a given host's traffic because only the router that answered the ARP is used. Specification, page 4, lines 15-16. Also, customers are reluctant to change their main router configuration to enable such a function. Specification, page 4, lines 16-18. Therefore, there is a need in the art for providing load balancing for traffic on the Internet. Specification, page 4, lines 18-19.

The problems outlined above may at least in part be solved in some embodiments by a data transmission system operable for transmitting packet data from an Internet Protocol (IP) host over an IP network comprising an IP layer. Specification, page 5, lines 10-11; element 34 of Figure 4. The system may further comprise a network layer coupled to the IP network where the IP host is coupled to the IP network via a layer 2 network. Specification, page 5, lines 11-13; elements 10, 16 and 18 of Figure 4. The layer 2 network may interface the IP network with a set of routers. Specification, page 5, lines 13-14; elements 16, 18, 20, 22 and 24 of Figure

4. The system may further comprise a Multiple Address Resolution Protocol (MARP) layer where the MARP layer is between the IP layer and the network layer. Specification, page 5, lines 14-15; element 36 of Figure 4. The MARP layer may be operable for selecting one router of the set of routers in response to a next hop IP address provided by the IP layer to the MARP layer when a packet of data is to be transmitted from the IP host over the IP network. Specification, page 5, lines 15-18; elements 10, 16, 20, 22, 24, 34 and 36 of Figure 4.

In another embodiment of the present invention, a method of selecting a router by an IP host in a data transmission system transmitting packetized data from the IP host having at least an IP layer and a network layer to a plurality of workstations by an intermediary of an IP network, and wherein the IP host is coupled to the IP network via a layer 2 network interfacing the IP network by a set of routers, the method may comprise the step of determining a list of candidate routers from the set of routers. Specification, page 15, claim 5, lines 1-6; elements 10, 12, 14, 16, 18, 20, 22, 24, 26, 34 of Figure 4; step 58 of Figure 3. The method may further comprise determining a list of active candidate routers from the list of candidate routers, the list of active candidate routers determined before selecting, from the set of routers, the router to be used for transmitting the packetized data. Specification, page 15, claim 5, lines 7-9; step 62 of Figure 3. The method may further comprise selecting the router to be used for transmitting the packetized data from the list of active candidate routers. Specification, page 10, lines 17-19; page 15, claim 5, lines 11-12; step 62 of Figure 3.

In another embodiment of the present invention, a computer program product embodied in a machine readable medium, including programming for selecting a router by an IP host in a data transmission system transmitting packetized data from the IP host having at least an IP layer and a network layer to a plurality of workstations by an intermediary of an IP network, and wherein the IP host is coupled

to the IP network via a layer 2 network interfacing the IP network by a set of routers comprising a program of instruction for performing the step of determining a list of candidate routers from the set of routers. Specification, page 17, claim 9, lines 1-8; elements 10, 12, 14, 16, 18, 20, 22, 24, 26, 34 of Figure 4; step 58 of Figure 3. The computer program product may further comprise determining a list of active candidate routers from the list of candidate routers, the list of active candidate routers determined before selecting, from the set of routers, the router to be used for transmitting the packetized data. Specification, page 17, claim 9, lines 9-12; step 62 of Figure 3. The computer program product may further comprise selecting the router to be used for transmitting the packetized data from the list of active candidate routers. Specification, page 10, lines 17-19; page 17, claim 9, lines 13-14; step 62 of Figure 3.

In another embodiment of the present invention, an Internet Protocol (IP) network may comprise an IP host, a Local Area Network (LAN) coupled to the IP host; an IP network coupled to the LAN and a set of workstations coupled to the LAN via the IP network. Specification, page 19, claim 13, lines 1-5; elements 10, 12, 14, 16 and 18 of Figure 4. The IP host may further comprise an IP layer; a network layer coupled to the IP network, wherein the IP host is coupled to the IP network via a layer 2 network, the layer 2 network interfacing the IP network with a set of routers; and a Multiple Address Resolution Protocol (MARP) layer, the MARP layer between the IP layer and the network layer, the MARP layer operable for selecting one router of the set of routers in response to a next hop IP address provided by the IP layer to the MARP layer when a packet of data is to be transmitted from the IP host over the IP network. Specification, page 19, claim 13, lines 6-16; elements 10, 16, 18, 20, 22, 24, 34 and 36 of Figure 4.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 and 13 stand rejected under 35 U.S.C. §103(a) as being unpatenable over Brendel (U.S. Patent No. 6,182,139) in view of Wolff (U.S. Patent No. 6,185,601). Claims 2-12 and 14-16 stand rejected under 35 U.S.C. §103(a) as being unpatenable over Brendel in view of Wolff and in further view of Kshirsagar et al. (U.S. Patent No. 6,016,319) (hereinafter "Kshirsagar").

VII. ARGUMENT

A. Claims 1 and 13 are not properly rejected under 35 U.S.C. §103(a) as being unpatenable over Brendel in view of Wolff.

The Examiner has rejected claims 1 and 13 under 35 U.S.C. §103(a) as being unpatentable over Brendel in view of Wolff. Paper No. 10, page 2. Appellants respectfully traverse for at least the reasons stated below.

1. The Examiner has not presented any objective evidence for combining Brendel with Wolff.

A *prima facie* showing of obviousness requires the Examiner to establish, *inter alia*, that the prior art references teach or suggest, either alone or in combination, all of the limitations of the claimed invention, and the Examiner must provide a motivation or suggestion to combine or modify the prior art reference to make the claimed inventions. M.P.E.P. §2142. The showings must be clear and particular and supported by objective evidence. *In re Lee*, 277 F.3d 1338, 1343, 61 U.S.P.Q.2d 1430, 1433-34 (Fed. Cir. 2002); *In re Kotzab*, 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000); *In re Dembiczak*, 50 U.S.P.Q.2d. 1614, 1617 (Fed. Cir. 1999). Broad conclusory statements regarding the teaching of multiple references, standing alone, are not evidence. *Id.*

The Examiner's motivation for modifying Brendel with Wolff to have an IP host coupled to an IP network via a layer 2 network where the layer 2 network interfaces the IP network with a set of routers, as recited in claim 1 and similarly in claims 5, 9 and 13, is "because Wolff's teaching would allow data to be transmitted in a load balancing manner with optimized throughput [Wolff, col 2, lines 35-40]." Paper No. 10, page 3. This motivation is insufficient to support a *prima facie* case of obviousness as discussed below.

The Examiner's motivation appears to have been gleaned from the secondary reference (Wolff). In fact, the Examiner cites column 2, lines 35-40 of Wolff as support for his motivation. Paper No. 10, page 3. This is not evidence as to why one of ordinary skill in the art with the primary reference (Brendel) in front of him would have been motivated to modify the primary reference (Brendel) with the teachings of the secondary reference (Wolff). The Examiner's motivation is a motivation for the secondary reference (Wolff) to solve its problem. This is not a suggestion to combine the primary reference (Brendel) with the secondary reference (Wolff). The Examiner must provide evidence as to why one of ordinary skill in the art with the primary reference (Brendel) in front of him, which teaches a client-side dispatcher that resides on a client machine below the high-level client application and TCP/IP layers where the client-side dispatcher performs TCP state migration to relocate the client-server TCP connection to a new server by storing packets locally and later altering them before transmission (Abstract of Brendel), would have been motivated to modify the primary reference (Brendel) with the teachings of the secondary reference (Wolff), which teaches methods for load rebalancing by clients (Abstract of Wolff). *See In re Lee*, 61 U.S.P.Q.2d 1430, 1433-1434 (Fed. Cir. 2002); *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000). Merely stating what the secondary reference teaches is not evidence for combining a primary reference (Brendel) with the secondary reference (Wolff). *See Id.* Consequently, the Examiner's motivation is insufficient to

support a *prima facie* case of obviousness for rejecting claims 1-16. *In re Lee*, 61 U.S.P.Q.2d 1430, 1434 (Fed. Cir. 2002).

Further, the Examiner must submit objective evidence and not rely on his own subjective opinion in support of combining Brendel, which teaches a client-side dispatcher that resides on a client machine below the high-level client application and TCP/IP layers where the client-side dispatcher performs TCP state migration to relocate the client-server TCP connection to a new server by storing packets locally and later altering them before transmission, with Wolff, which teaches methods for load rebalancing by clients. There is no suggestion in Brendel of performing load rebalancing. Neither is there any suggestion in Brendel of performing load rebalancing by clients. Since the Examiner has not submitted objective evidence for modifying Brendel with Wolff, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 1-16. *Id.*

Further, the Examiner must submit objective evidence and not rely on his own subjective opinion in support of modifying Brendel to allow data to be transmitted in a load balancing manner with optimized throughput (Examiner's motivation). *Id.* There is no suggestion in Brendel of transmitting data in a load balancing manner. Neither is there any suggestion in Brendel of transmitting data in a load balancing manner with optimized throughput. Since the Examiner has not submitted objective evidence for modifying Brendel to allow data to be transmitted in a load balancing manner with optimized throughput, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 1-16. *Id.*

Further, the Examiner must submit objective evidence and not rely on his own subjective opinion in support of modifying Brendel to have an IP host coupled to an IP network via a layer 2 network where the layer 2 network interfaces the IP network with a set of routers (Examiner admits that Brendel does not teach this limitation). *Id.* There is no suggestion in Brendel of having an IP host coupled to an

IP network via a layer 2 network. Neither is there any suggestion in Brendel of having an IP host coupled to an IP network via a layer 2 network where the layer 2 network interfaces the IP network. Neither is there any suggestion in Brendel of having an IP host coupled to an IP network via a layer 2 network where the layer 2 network interfaces the IP network with a set of routers. Since the Examiner has not submitted objective evidence for modifying Brendel to have an IP host coupled to an IP network via a layer 2 network where the layer 2 network interfaces the IP network with a set of routers, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 1-16. *Id.*

As a result of the foregoing, Appellants respectfully assert that the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 1-16. M.P.E.P. §2143.

2. Brendel and Wolff, taken singly or in combination, do not teach or suggest the following limitations.

Appellants respectfully assert that Brendel and Wolff, taken singly or in combination, do not teach or suggest "a Multiple Address Resolution Protocol (MARP) layer, said MARP layer between said IP layer and said network layer, said MARP layer operable for selecting one router of said set of routers in response to a next hop IP address provided by said IP layer to said MARP layer when a packet of data is to be transmitted from said IP host over said IP network" as recited in claim 1 and similarly in claim 13. The Examiner cites element 20 (client-side dispatcher) in Figure 3 and column 11, lines 2-12 and 19-26 of Brendel as teaching the above-cited claim limitation. Paper No. 10, pages 2 and 6. Appellants respectfully traverse and assert that Brendel instead teaches client-side dispatcher 20 that intercepts IP packets from the IP layer before they are sent to the data link layer. Column 6, lines 11-13. Brendel further teaches that the client-side dispatcher sends out many connection packets to different servers. Column 5, lines 40-41; column 11, lines 5-6. Brendel further teaches that the server that responds first is likely to be the least loaded or the

closest server to the client on the network. Column 5, lines 41-43; column 11, lines 6-8. Brendel further teaches that the connection is acknowledged with this first responding server while connections to the slower servers are cancelled by sending them reset packets. Column 5, lines 43-45.

Thus, Brendel teaches that the client-side dispatcher assigns a server to the client. This language is not the same as selecting a router from a set of routers. Further, this language is not the same as selecting a router in response to a next hop IP address. There is no language in Brendel of assigning a server based in response to a next hop IP address. Further, the language in the cited passages of Brendel do not teach selecting a router in response to a next hop IP address provided by an IP layer to a MARP layer. Neither does Brendel teach selecting a router in response to a next hop IP address provided by an IP layer to a MARP layer when a packet of data is to be transmitted from an IP host over an IP network. Therefore, the Examiner has not presented a *prima facie* of obviousness since the Examiner is relying upon an incorrect, factual predicate in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

As a result of the foregoing, Appellants respectfully assert that there are numerous claim limitations not taught or suggested in the cited prior art, and thus the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 1 and 13 as being unpatentable over Brendel in view of Wolff. M.P.E.P. §2143.

B. Claims 2-12 and 14-16 are not properly rejected under 35 U.S.C. §103(a) as being unpatenable over Brendel in view of Wolff and in further view of Kshirsagar.

The Examiner has rejected claims 2-12 and 14-16 under 35 U.S.C. §103(a) as being unpatentable over Brendel in view of Wolff and in further view of Kshirsagar. Paper No. 10, page 4. Appellants respectfully traverse for at least the reasons stated below.

1. The Examiner has not presented any objective evidence for combining Brendel with Wolff and Kshirsagar.

As stated above, a *prima facie* showing of obviousness requires the Examiner to establish, *inter alia*, that the prior art references teach or suggest, either alone or in combination, all of the limitations of the claimed invention, and the Examiner must provide a motivation or suggestion to combine or modify the prior art reference to make the claimed inventions. M.P.E.P. §2142. The showings must be clear and particular and supported by objective evidence. *In re Lee*, 277 F.3d 1338, 1343, 61 U.S.P.Q.2d 1430, 1433-34 (Fed. Cir. 2002); *In re Kotzab*, 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000); *In re Dembiczak*, 50 U.S.P.Q.2d. 1614, 1617 (Fed. Cir. 1999). Broad conclusory statements regarding the teaching of multiple references, standing alone, are not evidence. *Id.*

The Examiner's motivation for modifying Brendel with Wolff and Kshirsagar to provide an IP host with an Address Resolution Protocol (ARP) where the ARP is operable to convert any IP address into a network address of a router to be used in a layer 2 network by mapping the IP address, in an ARP table into a network address of an active router selected from the set of routers, as recited in claim 2 and similarly in claim 14, is "because Kshirsagar's teaching of ARP technique would allow addresses to be mapped between IP address[es] to different network address[es] for transmission, which reduces the burden on [the] user of remembering different network addresses of different communication medium." Paper No. 10, page 4. This motivation is insufficient to support a *prima facie* case of obviousness as discussed below.

The Examiner's motivation appears to have been gleaned from the secondary reference (Kshirsagar). For example, column 10, line 60 – column 11, line 11 of Kshirsagar teaches mapping a MAC address to an ATM address that was previously established for a different MAC address and returns the VCI and ATM address for

that connection instead of establishing a new connection. The Examiner's motivation is not evidence as to why one of ordinary skill in the art with the primary reference (Brendel) in front of him would have been motivated to modify the primary reference (Brendel) with the teachings of the secondary references (Wolff and Kshirsagar). The Examiner's motivation is a motivation for the secondary reference (Kshirsagar) to solve its problem. This is not a suggestion to combine the primary reference (Brendel) with the secondary references (Wolff and Kshirsagar). The Examiner must provide evidence as to why one of ordinary skill in the art with the primary reference (Brendel) in front of him, which teaches a client-side dispatcher that resides on a client machine below the high-level client application and TCP/IP layers where the client-side dispatcher performs TCP state migration to relocate the client-server TCP connection to a new server by storing packets locally and later altering them before transmission (Abstract of Brendel), would have been motivated to modify the primary reference (Brendel) with the teachings of the secondary reference (Wolff), which teaches methods for load rebalancing by clients (Abstract of Wolff), along with the teachings of the other secondary reference (Kshirsagar), which teaches transporting connectionless datagrams over a connection-oriented network in which the address resolution function and the connection setup function are removed from the sending host (Abstract of Kshirsagar). *See In re Lee*, 61 U.S.P.Q.2d 1430, 1433-1434 (Fed. Cir. 2002); *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000). Merely stating what the secondary reference teaches is <u>not</u> evidence for combining a primary reference (Brendel) with the secondary references (Wolff and Kshirsagar). *See Id.* Consequently, the Examiner's motivation is insufficient to support a *prima facie* case of obviousness for rejecting claims 2-12 and 14-16. *In re Lee*, 61 U.S.P.Q.2d 1430, 1434 (Fed. Cir. 2002).

Further, the Examiner must submit objective and not rely on his own subjective opinion in support of combining Brendel, which teaches a client-side dispatcher that resides on a client machine below the high-level client application and

TCP/IP layers where the client-side dispatcher performs TCP state migration to relocate the client-server TCP connection to a new server by storing packets locally and later altering them before transmission, with Wolff, which teaches methods for load rebalancing by clients, along with Kshirsagar, which teaches transporting connectionless datagrams over a connection-oriented network in which the address resolution function and the connection setup function are removed from the sending host. There is no suggestion in Brendel of transporting connectionless datagrams. Neither is there any suggestion in Brendel of transporting connectionless datagrams over a connection-oriented network. Neither is there any suggestion in Brendel of transporting connectionless datagrams over a connection-oriented network in which the address resolution function and the connection setup function are removed from the sending host. Since the Examiner has not submitted objective evidence for modifying Brendel with Wolff and Kshirsagar, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 2-12 and 14-16. *Id.*

Further, the Examiner must submit objective and not rely on his own subjective opinion in support of modifying Brendel to allow IP addresses to be mapped to different network addresses for transmission (Examiner's motivation). *Id.* There is no suggestion in Brendel of mapping addresses. Neither is there any suggestion in Brendel of mapping IP addresses to different network addresses. Since the Examiner has not submitted objective evidence for modifying Brendel to allow IP addresses to be mapped to different network addresses for transmission, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 2-4 and 14-16. *Id.*

Further, the Examiner must submit objective and not rely on his own subjective opinion in support of modifying Brendel to provide an IP host with an Address Resolution Protocol (ARP) where the ARP is operable to convert any IP address into a network address of a router to be used in a layer 2 network by mapping

the IP address, in an ARP table into a network address of an active router selected from the set of routers (Examiner admits that Brendel does not teach this limitation). *Id.* There is no suggestion in Brendel of having an IP host with an ARP. Neither is there any suggestion in Brendel of having an IP host with an ARP where the ARP is operable to convert any IP address into a network address. Neither is there any suggestion in Brendel of having an IP host with an ARP where the ARP is operable to convert any IP address into a network address of a router to be used in a layer 2 network. Neither is there any suggestion in Brendel of having an IP host with an ARP where the ARP is operable to convert any IP address into a network address of a router to be used in a layer 2 network by mapping the IP address, in an ARP table into a network address of an active router selected from the set of routers. Since the Examiner has not submitted objective evidence for modifying Brendel to provide an IP host with an Address Resolution Protocol (ARP) where the ARP is operable to convert any IP address into a network address of a router to be used in a layer 2 network by mapping the IP address, in an ARP table into a network address of an active router selected from the set of routers, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 2-4 and 14-16. *Id.*

Further, the Examiner's motivation for modifying Brendel with Wolff and Kshirsagar to determine a list of active candidate routers from a list of candidate routers, as recited in claim 5 and similarly in claim 9, is "because Wolff's teaching of determining step of active routers would allow [the] host to determine [the] path to transmit its requests for better load balancing." Paper No. 10, page 5. This motivation is insufficient to support a *prima facie* case of obviousness as discussed below.

The Examiner's motivation appears to have been gleaned from the secondary reference (Wolff). In particular, Wolff teaches that client load rebalancing allows the clients to optimize throughput between themselves and the resources accessed by the nodes. Abstract. The Examiner's motivation is not evidence as to why one of

ordinary skill in the art with the primary reference (Brendel) in front of him would have been motivated to modify the primary reference (Brendel) with the teachings of the secondary references (Wolff and Kshirsagar). The Examiner's motivation is a motivation for the secondary reference (Wolff) to solve its problem. This is not a suggestion to combine the primary reference (Brendel) with the secondary references (Wolff and Kshirsagar). The Examiner must provide evidence as to why one of ordinary skill in the art with the primary reference (Brendel) in front of him, which teaches a client-side dispatcher that resides on a client machine below the high-level client application and TCP/IP layers where the client-side dispatcher performs TCP state migration to relocate the client-server TCP connection to a new server by storing packets locally and later altering them before transmission (Abstract of Brendel), would have been motivated to modify the primary reference (Brendel) with the teachings of the secondary reference (Wolff), which teaches methods for load rebalancing by clients (Abstract of Wolff), along with the teachings of the other secondary reference (Kshirsagar), which teaches transporting connectionless datagrams over a connection-oriented network in which the address resolution function and the connection setup function are removed from the sending host (Abstract of Kshirsagar). *See In re Lee*, 61 U.S.P.Q.2d 1430, 1433-1434 (Fed. Cir. 2002); *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000). Merely stating what the secondary reference teaches is not evidence for combining a primary reference (Brendel) with the secondary references (Wolff and Kshirsagar). *See Id.* Consequently, the Examiner's motivation is insufficient to support a *prima facie* case of obviousness for rejecting claims 2-12 and 14-16. *In re Lee*, 61 U.S.P.Q.2d 1430, 1434 (Fed. Cir. 2002).

Further, the Examiner must submit objective and not rely on his own subjective opinion in support of combining Brendel, which teaches a client-side dispatcher that resides on a client machine below the high-level client application and TCP/IP layers where the client-side dispatcher performs TCP state migration to

relocate the client-server TCP connection to a new server by storing packets locally and later altering them before transmission, with Wolff, which teaches methods for load rebalancing by clients. There is no suggestion in Brendel of client load rebalancing. Since the Examiner has not submitted objective evidence for modifying Brendel with Wolff and Kshirsagar, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 2-12 and 14-16. *Id.*

Further, the Examiner must submit objective and not rely on his own subjective opinion in support of modifying Brendel to allow the host to determine the path to transmit its requests for better load balancing (Examiner's motivation). *Id.* There is no suggestion in Brendel of allowing a host to determine a path to transmit its requests. Neither is there any suggestion in Brendel of allowing a host to determine a path to transmit its requests for better load balancing. Since the Examiner has not submitted objective evidence for modifying Brendel to allow the host to determine the path to transmit its requests for better load balancing, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 5-12. *Id.*

Further, the Examiner must submit objective and not rely on his own subjective opinion in support of modifying Brendel to determine a list of active candidate routers from a list of candidate routers (Examiner admits that Brendel does not teach this limitation). *Id.* There is no suggestion in Brendel of determining a list of active candidate routers from a list of candidate routers. Since the Examiner has not submitted objective evidence for modifying Brendel to determine a list of active candidate routers from a list of candidate routers, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 5-12. *Id.*

Further, the Examiner states that there is motivation to combine Brendel, Wolff and Kshirsagar "because it would allow to balance the workload in the communication network to reduce network congestion." Paper No. 10, page 8. This

motivation is insufficient to support a *prima facie* case of obviousness as it is merely the Examiner's subjective opinion.

The Examiner must submit objective evidence and not rely on his own subjective opinion in support of combining Brendel with Wolff and Kshirsagar. *Id.* There is no suggestion in Brendel of balancing a workload in the communication network (Examiner's motivation). Neither is there any suggestion in Brendel of balancing a workload in the communication network to reduce network congestion (Examiner's motivation). Since the Examiner has not submitted objective evidence for combining Brendel with Wolff and Kshirsagar, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 2-12 and 14-16. *Id.*

As a result of the foregoing, Appellants respectfully assert that the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 2-12 and 14-16. M.P.E.P. §2143.

2. Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest the following limitations.

Appellants respectfully assert that Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest "wherein said IP host is provided with an Address Resolution Protocol (ARP), said ARP operable to convert any IP address into a network address of a router to be used in said layer 2 network by mapping said IP address, in an ARP table into a network address of an active router selected from said set of routers" as recited in claim 2 and similarly in claim 14. The Examiner cites column 1, lines 46-67 of Kshirsagar as teaching the above-cited claim limitation. Paper No. 10, page 4. Appellants respectfully traverse and assert that Kshirsagar instead teaches that the source IP host sends an ARP request to a server. Kshirsagar further teaches that the server resolves the destination IP address to an ATM address and returns the ATM address to the source host. However, there is no language in the cited passage that teaches an IP host converting an IP address into a network address

of a router. Instead, Kshirsagar simply teaches that the IP host sends an ARP request. Neither is there any language in the cited passage that teaches an IP host converting an IP address into a network address of a router to be used in a layer 2 network. Neither is there any language in the cited passage that teaches an IP host converting an IP address into a network address of a router to be used in a layer 2 network by mapping the IP address in an ARP table into a network address of an active router selected from a set of routers. Therefore, the Examiner has not presented a *prima facie* case of obviousness since the Examiner is relying upon an incorrect, factual predicate in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Appellants further assert that Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest "wherein said MARP layer includes, a MARP table mapping said next hop IP address into a list of IP addresses of routers, said router addresses indicating routers selectable from said set of candidate routers, said IP addresses of said routers being mapped in said ARP table indicating active candidate routers able to be used as routers for transmitting said packet of data from said IP host to one or more of said workstations via said IP network" as recited in claim 3 and similarly in claim 15. The Examiner cites column 6, lines 40-57; column 10, lines 25-28; column 12, lines 6-8 and column 13, lines 40-46 and 50-51 of Brendel as teaching the above-cited claim limitation. Paper No. 10, pages 4-5 and 7. Appellants respectfully traverse and assert that Brendel instead teaches that the client-side dispatcher includes an address translation table that converts the IP address and port of a requested server to an IP address and TCP port of a relocated server. Brendel further teaches that a load-balancer may supply configuration information to the client-side dispatcher that specifies a list of servers for certain URL's. Brendel further teaches that URL's that are not configured for by the client-side dispatcher could be looked up by sending a request to a dispatching server.

There is no language in the cited passages that teaches mapping a next hop IP address into a list of IP addresses of routers. Instead, Brendel teaches that the client-side dispatcher converts the IP address and port of a requested server to an IP address and TCP port of a relocated server. This is not the same as mapping a next hop IP address. Appellants have performed a search of "next hop" in Brendel and were unable to identify this term or any variation thereof. Further, Brendel does not teach mapping a next hop IP address into a list of IP addresses of routers. Brendel, as stated above, instead teaches that the client-side dispatcher converts the IP address and port of a requested server to an IP address and TCP port of a relocated server. The client-side dispatcher does not map an address into a list of IP addresses. Further, servers are not routers. Further, there is no language in the cited passages that teaches that the router addresses indicate routers selectable from a set of candidate routers. Further, there is no language in the cited passages regarding mapping IP addresses of routers in an ARP table indicating active candidate routers able to be used as routers for transmitting a packet of data from an IP host to a workstation via an IP network. The Examiner had previously asserted that client-side dispatcher 20 corresponds to MARP layer. Paper No. 10, page 6. However, the Examiner has failed to show that client-side dispatcher 20 includes a MARP table that performs the above-cited features. Therefore, the Examiner has not presented a *prima facie* case of obviousness since the Examiner is relying upon an incorrect, factual predicate in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Appellants further assert that Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest "wherein in one of said routers is selected amongst said active candidate routers by using hash coding techniques based upon destination IP addresses, a pair of source and destination ports in said packet of data to be transmitted, and said active candidate router IP addresses" as recited in claim 4 and similarly in claims 8, 12 and 16. The Examiner cites column 11, lines 24-26 and column 12, lines 1-8 of Brendel as teaching the above-cited claim limitation. Paper

No. 10, page 5. Appellants respectfully traverse and assert that Brendel instead teaches that multiple copies of the SYN packet are generated and that the destination IP address and TCP ports change in each packet to a different server. Further, Brendel teaches a session table index which is a hash table. Brendel simply mentions a hash table but does not mention selecting amongst active candidate routers using hash coding techniques. Further, there is no language in Brendel that teaches using hash coding techniques based upon destination IP addresses, a pair of source and destination ports in a packet of data to be transmitted, and an active candidate router IP addresses. Therefore, the Examiner has not presented a *prima facie* case of obviousness since the Examiner is relying upon an incorrect, factual predicate in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Appellants further assert that Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest "determining a list of candidate routers from said set of routers" as recited in claim 5 and similarly in claim 9. The Examiner states that this limitation is rejected for reasons stated in the rejections of claims 1-3. Paper No. 10, page 5. However, this claim limitation was not cited in claims 1-3 and consequently was never addressed by the Examiner. The Examiner has not cited to any passage in any of the references as teaching the above-cited claim limitation. The Examiner is reminded that the Examiner bears the initial burden and must submit objective evidence and not rely on his own subjective opinion in support of a *prima facie* case of obviousness *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992). Since the Examiner has not provided any evidence that any of the references teach the above-cited claim limitation, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 5 and 9. M.P.E.P. §2143.

Appellants further assert that Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest "determining a list of active candidate routers from said list of candidate routers, said list of active candidate routers determined before selecting, from said set of routers, said router to be used for transmitting said

packetized data" as recited in claim 5 and similarly in claim 9. The Examiner cites column 2, lines 52-6 and column 3, lines 3-15 of Wolff as teaching the above-cited claim limitation. Paper No. 10, pages 5 and 8. Appellants respectfully traverse and assert that Wolff instead teaches determining a utilization condition on the first of the plurality of server nodes. Wolff further teaches redirecting subsequent requests for at least one resource to a second server node among the plurality of server nodes in response to the determining act. The determining step in the cited passage of Wolff is not the same as determining a list of candidate routers from a list of candidate routers. In fact, the determining step in the cited passage of Wolff does not mention routers but instead mentions server nodes. Neither is the determining step in Wolff performed before selecting from a set of routers the router to be used for transmitting packetized data. Instead, the determining step in Wolff is performed prior to redirecting subsequent requests for a resource to a server node among a plurality of server nodes. Redirecting a request to a server node is not the same as selecting a router to be used for transmitting data. The server node is not used for transmitting data but used for servicing the request. Therefore, the Examiner has not presented a *prima facie* case of obviousness since the Examiner is relying upon an incorrect, factual predicate in support of the rejection. *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998).

Appellants further assert that Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest "selecting said router to be used for transmitting said packetized data from said list of active candidate routers" as recited in claim 5 and similarly in claim 9. The Examiner states that this limitation is rejected for reasons stated in the rejections of claims 1-3. Paper No. 10, page 5. However, this claim limitation was not cited in claims 1-3 and consequently was never addressed by the Examiner. The Examiner has not cited to any passage in any of the references as teaching the above-cited claim limitation. The Examiner is reminded that the Examiner bears the initial burden and must submit objective evidence and not rely on

his own subjective opinion in support of a *prima facie* case of obviousness *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992). Since the Examiner has not provided any evidence that any of the references teach the above-cited claim limitation, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 5 and 9. M.P.E.P. §2143.

Appellants further assert that Brendel, Wolff and Kshirsagar, taken singly or in combination, do not teach or suggest "wherein said step of determining said list of candidate routers is performed by said MARP layer by a look up in a MARP table using a next hop IP address as an entry" as recited in claim 7 and similarly in claim 11. The Examiner states that this limitation is rejected for reasons stated in the rejections of claims 1-3. Paper No. 10, page 5. However, this claim limitation was not cited in claims 1-3 and consequently was never addressed by the Examiner. The Examiner has not cited to any passage in any of the references as teaching the above-cited claim limitation. The Examiner is reminded that the Examiner bears the initial burden and must submit objective evidence and not rely on his own subjective opinion in support of a *prima facie* case of obviousness *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992). Since the Examiner has not provided any evidence that any of the references teach the above-cited claim limitation, the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 7 and 11. M.P.E.P. §2143.

As a result of the foregoing, Appellants respectfully assert that there are numerous claim limitations not taught or suggested in the cited prior art, and thus the Examiner has not presented a *prima facie* case of obviousness for rejecting claims 2-12 and 14-16 as being unpatentable over Brendel in view of Wolff and in further view of Kshirsagar. M.P.E.P. §2143.

VIII. CONCLUSION

For the reasons noted above, the rejections of claims 1-16 are in error. Appellants respectfully request reversal of the rejections and allowance of claims 1-16.

Respectfully submitted,
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APPENDIX

1. A data transmission system operable for transmitting packet data from an Internet Protocol (IP) host over an IP network comprising:

an IP layer;

a network layer coupled to the IP network, wherein said IP host is coupled to said IP network via a layer 2 network, said layer 2 network interfacing said IP network with a set of routers; and

a Multiple Address Resolution Protocol (MARP) layer, said MARP layer between said IP layer and said network layer, said MARP layer operable for selecting one router of said set of routers in response to a next hop IP address provided by said IP layer to said MARP layer when a packet of data is to be transmitted from said IP host over said IP network.

2. The data transmission system according to claim 1, wherein said IP host is provided with an Address Resolution Protocol (ARP), said ARP operable to convert any IP address into a network address of a router to be used in said layer 2 network by mapping said IP address, in an ARP table into a network address of an active router selected from said set of routers.

3. The data transmission system according to claim 2, wherein said MARP layer includes, a MARP table mapping said next hop IP address into a list of IP addresses of routers, said router addresses indicating routers selectable from said set of candidate routers, said IP addresses of said routers being mapped in said ARP table indicating active candidate routers able to be used as routers for transmitting said packet of data from said IP host to one or more of said workstations via said IP network.

4. The data transmission system according to claim 3, wherein in one of said routers is selected amongst said active candidate routers by using hash coding

techniques based upon destination IP addresses, a pair of source and destination ports in said packet of data to be transmitted, and said active candidate router IP addresses.

5. A method of selecting a router by an IP host in a data transmission system transmitting packetized data from said IP host having at least an IP layer and a network layer to a plurality of workstations by an intermediary of an IP network, and wherein said IP host is coupled to said IP network via a layer 2 network interfacing said IP network by a set of routers, said method comprising the steps of:

determining a list of candidate routers from said set of routers;

determining a list of active candidate routers from said list of candidate routers, said list of active candidate routers determined before selecting, from said set of routers, said router to be used for transmitting said packetized data; and

selecting said router to be used for transmitting said packetized data from said list of active candidate routers.

6. The method according to claim 5, wherein said step of determining said list of active candidate router IP addresses is performed by a Multiple Address Resolution Protocol (MARP) layer between said IP layer and said network layer of said IP host.

7. The method according to claim 6, wherein said step of determining said list of candidate routers is performed by said MARP layer by a look up in a MARP table using a next hop IP address as an entry.

8. The method according to claim 7, wherein said step of selecting said router to use for transmitting said packetized data is performed by using hash coding techniques based upon destination IP addresses, a pair of source and destination ports in said packetized data to be transmitted, and IP addresses of said active candidate routers.

9. A computer program product embodied in a machine readable medium, including programming for selecting a router by an IP host in a data transmission system transmitting packetized data from said IP host having at least an IP layer and a network layer to a plurality of workstations by an intermediary of an IP network, and wherein said IP host is coupled to said IP network via a layer 2 network interfacing said IP network by a set of routers comprising a program of instruction for performing the steps of:

determining a list of candidate routers from said set of routers;

determining a list of active candidate routers from said list of candidate routers, said list of active candidate routers determined before selecting, from said set of routers, said router to be used for transmitting said packetized data; and

selecting said router to be used for transmitting said packetized data from said list of active candidate routers.

10. The computer program product according to claim 9, wherein said step of determining said list of active candidate router IP addresses is performed by a Multiple Address Resolution Protocol (MARP) layer between said IP layer and said network layer of said IP host.

11. The computer program product according to claim 10, wherein said step of determining said list of candidate routers is performed by said MARP layer by a look up in a MARP table using a next hop IP address as an entry.

12. The computer program product according to claim 11, wherein said step of selecting said router to use for transmitting said packetized data is performed by using hash coding techniques based upon destination IP addresses, a pair of source and destination ports in said packetized data to be transmitted, and IP addresses of said active candidate routers.

13. An Internet Protocol (IP) network comprising:

an IP host;

a Local Area Network (LAN) coupled to the IP host;

an IP network coupled to the LAN;

a set of workstations coupled to the LAN via the IP network;

said IP host further comprising:

an IP layer;

a network layer coupled to the IP network, wherein said IP host is coupled to said IP network via a layer 2 network, said layer 2 network interfacing said IP network with a set of routers; and

a Multiple Address Resolution Protocol (MARP) layer, said MARP layer between said IP layer and said network layer, said MARP layer operable for selecting one router of said set of routers in response to a next hop IP address provided by said IP layer to said MARP layer when a packet of data is to be transmitted from said IP host over said IP network.

14. The IP network according to claim 13, wherein said IP host is provided with an Address Resolution Protocol (ARP), said ARP operable to convert any IP address into a network address of a router to be used in said layer 2 network by mapping said IP address, in an ARP table into a network address of an active router selected from said set of routers.

15. The IP network according to claim 14, wherein said MARP layer includes, a MARP table mapping said next hop IP address into a list of IP addresses of routers, said router addresses indicating routers selectable from said set of candidate routers, said IP addresses of said routers being mapped in said ARP table indicating active candidate routers able to be used as routers for transmitting said packet of data from said IP host to one or more of said workstations via said IP network.

16. The IP network according to claim 15, wherein in one of said routers is selected amongst said active candidate routers by using hash coding techniques based upon destination IP addresses, a pair of source destination ports in said packet of data to be transmitted, and said active candidate router IP addresses.